tions, and increases the likelihood that students will learn current practice rather than old approaches. Certification can reduce the uncertainty concerning the skills a worker obtains and increase the portability and the market value of the training. Wisconsin developed 20 occupational standards in collaboration with community colleges and associations of employers. The state has more than 1,200 apprentices in fields such as financial services, health services, printing, automobile technology, and biotechnology. States could partner to develop additional transportation-related programs.

TRAINING THE WORKFORCE: PROVIDING A CONTINUOUS LEARNING ENVIRONMENT

Training and retraining have become essential components of an organization's human resource activities.[9] Technology change and innovation are requiring continuous or lifelong learning to acquire and retain skills at an appropriate level.[10] Formal training of new employees has been found to decrease time to competency significantly, as well as to reduce operational problems (LeMay and Carr 1999).[11] Benchmarking studies indicate that exemplary organizations spend the equivalent of about 2 percent of their payroll costs on training (Becker et al. 2001). Such organizations view training as an investment in their people and the organization's future. They recognize that this investment helps forestall the costs and lost opportunities associated with inadequately trained employees.

Training is a necessity at all job levels. Lerman and Schmidt (1999) report that more than two-thirds of employers indicated that the skills required for production or support jobs had increased over the prior

[9] Retraining is an important means of upgrading employee skills in light of changing job requirements; it can also be an option for employees whose skills are no longer needed but who could continue to be effective contributors.

[10] The Federal Highway Administration has set a goal of spending 3 percent of annual agency payroll on training programs.

[11] Research has shown that new employees are vulnerable to voluntary turnover during their period of acclimation to the organization. Training and mentoring programs and coaching help forestall such turnover.

TABLE 4-5 Observations on Issues Faced by Training Program Directors (Cascio 1997, 265)

Issue	Comment
Commitment to training is lacking and uneven	Many organizations spend little on training. Some focus training on managers and professionals only
Aggregate expenditures on training are inadequate	While exemplary organizations spend 2 percent of annual payroll on training and even more, many organizations spend very little
Poaching trained workers provides a strong disincentive for training	Many SDOT managers have expressed this view[a]
While some managers view training as an investment, others see it as an expense with little evidence of return	The costs of not training are not well developed. Agency managers often must hide training expenditures
Government support for training often does not extend to incumbent workers	State government programs are generally aimed at economic development issues and support of "export" industries for their multiplier effect
Too much emphasis on senior managers	Training and development should extend to the overwhelming percentage of non–college graduates in the workforce
Ties between employers and schools are not very strong	While schools can be more responsive to labor market demands, employers must clearly communicate their needs to the schools
Labor organizations provide useful models for training programs that could be explored more fully	Unions have developed many first-rate apprenticeship programs in a number of crafts and have recognized and supported training programs for their members
Academic credentials are not good indicators of basic skill sets	Many entry-level employees lack basic skills in mathematics and writing

[a] In general this is the training paradox mentioned in the text. Several committee members expressed the view that employment of SDOT-trained engineers and technicians in the private sector is a good thing.

3 years. Nevertheless, agencies must address certain issues before training programs can achieve their full potential. Organizational commitment to training and adequate funding are key factors; these and other factors are described in Table 4-5.[12]

Training helps address many of the challenges faced by SDOTs and TAs today, including the need to keep skills current, changing

[12] Training proponents refer to the "training paradox" as follows: investment in training leads to better-trained employees, who then have more opportunities available to them in the job market.

skill needs in downsized organizations, an expanded agency mission, and rapidly changing technologies.[13] Training is also increasingly viewed as an enterprise aimed at yielding organizational performance improvement. In essence, training departments are becoming internal organizational development consultants whose focus expands to include performance management through training (Mason et al. 1992).

Transportation agencies and employees are acknowledging that traditional on-the-job training alone is not sufficient for keeping pace with advanced electronics-based technologies. Some TAs have negotiated union agreements that include growth, continued learning, and rewards for developing new skills, leading to advancement based on skills attainment rather than seniority (McGlothin Davis 2002, 13). Such agreements reflect a new understanding in today's workplace concerning roles: employers must provide training, education, and skill development opportunities, and employees must assume responsibility for developing and maintaining the needed skills.[14] Training to meet the needs of ITS was the driving force behind the ITS Professional Capacity Building (PCB) Program developed by the Federal Highway Administration (FHWA). This federally funded national program, with an annual budget of $3.5 million, was launched to provide training for state and local transportation staff to ensure the widest possible implementation of ITS technologies. Appendix B provides a brief history of the ITS PCB Program. Recognizing similar national capacity-building needs in other areas, FHWA has launched two other education and training initiatives—the Metropolitan Capacity Building Program and the Professional Excellence for Highway Safety Program. See Box 4-2 for more details. Both

[13] Most states operate state-funded programs to assist private companies in providing training for their employees but restrict eligibility for those funds to firms producing goods and services that may be imported to or exported from the state. More information on these programs is provided in Appendix F.

[14] The Metropolitan Atlanta Regional Transit Authority (MARTA) supports employee training by paying tuition reimbursement of 80 percent per course in a partnership agreement with Georgia State University, which tailors courses to meet the agency's needs. The agency reimbursement from MARTA can be packaged with state scholarship funds to pay for most educational costs at state universities, colleges, and technical schools in Georgia.

BOX 4-2

Recent FHWA Initiatives Aimed at Professional Capacity Building

FHWA's ITS Professional Capacity Building Program is well known and well documented (see Appendix B). FHWA has recently begun addressing professional capacity building for metropolitan transportation planners and highway safety specialists. The Metropolitan Capacity Building Program was launched in 2001 to help state and local transportation agency staffs meet the complex political, social, economic, and environmental demands of metropolitan areas. The program is designed for members of policy boards or executive committees, community leaders, professionals in metropolitan areas who participate in the metropolitan transportation planning process, and metropolitan planning organization (MPO) transportation staff. The program's aims are as follows:

- Gather and disseminate examples of effective metropolitan transportation planning practices from across the nation.
- Act as a centralized clearinghouse for information and contacts within the metropolitan transportation planning community.
- Provide background information for MPO board members to enhance their understanding of the metropolitan transportation planning process, their role within the process, and its relationship to community and societal goals.
- Provide information, training, and technical assistance to MPOs (including new MPOs and those designated as being in nonattainment for air quality).

The program incorporates information dissemination, technical assistance, training, education, outreach, and customer feedback. It is a collaborative effort of the Federal Transit Administration, FHWA, the American Association of State Highway and Transportation Officials (AASHTO), the American Public Transportation Association, and the Association of Metropolitan Planning Organizations.

FHWA's Office of Safety launched the Professional Excellence for Highway Safety Program to provide continuing education for safety professionals on the basis of an assessment of the needs of the safety profession. The ultimate aim is to reduce highway-related crashes, injuries, and fatalities. The program will coordinate interagency partnerships within the U.S. Department of Transportation to integrate the needs of all safety program stakeholders, providers, and customers and raise the safety awareness of legislators, the media, and other education providers, with emphasis on intersection safety, speeding, run-off-the-road crashes, and pedestrian and bicyclist safety. The program will encompass infrastructure enhancements, operations enhancements, equipment, and onboard vehicle technologies.

In an effort to bring more attention to the need for highway safety training, FHWA has begun an inventory of information on training courses, software, databases, and curricula to assist in training highway safety practitioners. It is also establishing a highway safety stakeholder database including such information as customer category, region, professional level, and organization.

programs are aimed at specific needs of state and local transportation agency staff; neither has attracted significant funding as yet.

Successful organizations use a range of techniques for training, including job rotation, on-the-job training, self-directed learning (often technology-based), mentor relationships, on-the-job coaching, special projects and assignments, and electronic learning technologies.[15] The use of technology-based training in particular has increased in recent years.[16] Such training can be expensive and resisted by both trainers and participants,[17] but it offers advantages, including the potential for presentation at a variety of locations, greater independence of scheduling, and opportunities for cost-sharing among like organizations (Tulgan 2001).

WORKFORCE RETENTION

Creating a workplace that employees find motivating and enriching is perhaps the most effective and low-cost retention strategy organizations can adopt (NAPA 2000). Employees want fair compensation, meaningful work, career advancement opportunities, increasing responsibility, and recognition and reward for their accomplishments.[18] *Fortune*'s 2001 Survey of the 100 Best Companies to Work For revealed that these companies address retention by devoting considerable resources to employee development, demonstrating to employees that they are valued, and paying attention to the importance of

[15] Training can also be differentiated with regard to whether it is offered in-house or contracted out. A key determinant in deciding between the two is the extent to which the training content requires internal knowledge, such as organizational values and culture, versus technical information.

[16] Many transit agencies use CD-ROM training programs for defensive driving training. Modules include *The Professional*, which discusses operator health, customer relations, and prechecking a bus and *Smart Driving+* which emphasizes bus equipment (pretrip inspections, potential road problems, and reporting of problems to the maintenance division).

[17] Estimates for the time required to design 1 hour of good, interactive Web-based instruction range between 80 and 350 hours (Rothwell and Benkowski 2002).

[18] Preferences of different groups of employees can vary as can be seen by comparing these preferences with those of transit agency employees shown in Table 4-4.